

REMARKS

Claims 1-26 were pending in this application prior to the final Office Action. By this amendment, claims 13-16 and 23-26 are canceled. Thus, claims 1-12 and 17-22 remain pending.

Referring now to the office action, the Examiner has objected to the amendment to the specification presented in the previous amendment filed on January 25, 2007. In particular, the Examiner asserts that the amendment of the phrase “an oscillation wave (i.e., shock wave)” to “shock wave” in the paragraph beginning on page 4, line 12, of the specification introduces new matter. However, Applicants respectfully disagree. While a shock wave may be one type of oscillation wave, not every oscillation wave is necessarily a shock wave. Thus, Applicants submit that the amendment to the specification, which was presented to correct the erroneous inclusion of the phrase “an oscillation wave (i.e., shock wave)”, does not broaden the scope of the disclosure, and does not present any new matter issues. Instead, the phrase “shock wave” was clearly included in the originally filed disclosure. Accordingly, Applicants respectfully request that this objection be reconsidered and withdrawn.

Claims 1-26 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over admitted prior art (APA) in view of Ohnishi (Pub. # 20040050176). In particular, the Examiner asserts that the only inventive feature in the instant invention is the use of the shock-wave (Oscillation Wave) generating piezoelectric element, that Ohnishi teaches the use of oscillation wave generating and receiving piezoelectric devices in the same arrangements as the APA positions the ultrasonic piezoelectric transducers, and that it would have been obvious to a person having ordinary skill in the art at the time the invention was made to use the oscillation wave generating and receiving piezoelectric elements for the known ultrasonic wave generating and receiving piezoelectric elements since such are mere alternatives that would function equally in the environment of measuring flow in a conduit without being in direct contact with the fluid.

In addition, the Examiner argues that Applicants have admitted that the oscillation wave is regarded as a shock wave, and asserts that such an admittance is acknowledged as an alternative type or name of a wave applied to a piezoelectric element. In particular, the

Examiner points to the erroneous description Applicants attempted to correct in their prior response and argues that page 4, lines 23-24, of the originally filed specification discloses that an oscillation wave is also a shock wave. However, as is clearly presented above, while a shock wave may be one type of oscillation wave, *not every oscillation wave is necessarily a shock wave*. Applicants corrected this erroneous portion of the specification to eliminate the type of confusion the Examiner is exhibiting here.

With respect to the rejection of claims 1-26 under 35 U.S.C. § 103(a), neither the APA nor Ohnishi, taken alone or in combination, disclose, suggest, or render obvious the invention recited in pending claims 1-12 and 17-22. In particular, contrary to the Examiner's statement that "the only inventive feature in the instant invention is the use of the shock-wave (Oscillation Wave) generating piezoelectric element," Applicants direct the Examiner's attention to the fact that pending claims 1-12 and 17-22 are directed to methods for measuring a flow rate of a fluid moving in a tube, which are clearly distinguishable from the teachings of Ohnishi.

The Examiner's attention is directed to the flow rate measuring-method described by Ohnishi, which is described, for example, in paragraphs [0026]-[0027]:

The present inventor has studied the conventional clamp-on ultrasonic flowmeter ... with respect to prolongation of the distance of ultrasonic wave transmission transmitting in the fluid by varying materials of the ultrasonic wave generating-detecting means and ultrasonic wave-propagating member and further trying various combinations of these materials. As a result, the inventor has acknowledged that it is very difficult to measure with a high accuracy a flow rate of a fluid moving in a tube having a small inner diameter.

For the above-described reason, the inventor has considered to utilize an oscillation wave which is transmitted in a wall of a tube and made detailed analysis on this oscillation wave. Heretofore, this oscillation wave has been considered to be a noise in the measurement of a flow rate. As a result, the inventor has discovered that the oscillation wave transmitted in the wall of the tube can be utilized to measure a flow rate of a fluid moving in the tube.

Then, Ohnishi describes his flow rate-measuring method as follows, in paragraphs [0029] - [0035].

The present invention resides in a method for measuring a flow rate of a fluid moving in a conduit which comprises the steps of:

- ...
- (3) generating an oscillation wave in the oscillation wave-generating means and applying the wave onto the wall;
- (4) measuring a period of time required for transmitting the generated oscillation wave to the oscillation wave-detecting means in the wall which oscillates in conjunction with the fluid moving with oscillation...

As for the voltage waveform, Ohnishi discloses the use of sine wave voltage, in paragraph [0157].

Thus, the inventive idea of Ohnishi resides in the use of an oscillation wave transmitted in the wall for the flow rate measurement. This is in contrast to the conventional flow rate measuring method in which an oscillation wave transmitted in the moving fluid is utilized.

In comparison with the flow rate measuring method of Ohnishi, the claimed method of the invention generally involves producing a shock wave by applying an impulse voltage with steep rising edge or steep falling edge to a piezoelectric element, and measuring flow-rate by measuring a period of time required for transmitting the generated shock wave through the moving fluid.

Applicants respectfully submit that Ohnishi fails to disclose these features and that the general inventive idea of the claimed invention is different from the inventive idea of Ohnishi. Furthermore, Tables 1 and 2, on pages 24 and 25 of the specification, and Fig. 16, clearly show that the flow rate-measuring method of the invention easily gives the flow rate of the fluid under measurement with a high accuracy. This utility is not attainable using the methods of Ohnishi.

Thus, because neither the APA nor Ohnishi, taken alone or in combination, disclose, suggest, or render obvious the invention recited in pending claims 1-12 and 17-22, Applicants

respectfully submit that the rejection of pending claims 1-12 and 17-22 under 35 U.S.C. § 103(a) in view of the APA and Ohnishi be reconsidered and withdrawn.

The present amendment is submitted in accordance with the provisions of 37 C.F.R. §1.116, which after Final Rejection permits entry of amendments placing the claims in better form for consideration on appeal. As the present amendment is believed to overcome outstanding rejections under 35 U.S.C. § 103, the present amendment places the application in better form for consideration on appeal. It is therefore respectfully requested that 37 C.F.R. §1.116 be liberally construed, and that the present amendment be entered.

In view of the foregoing, it is submitted that the present application is in condition for allowance and a notice to that effect is respectfully requested. If, however, the Examiner deems that any issue remains after considering this response, the Examiner is invited to contact the undersigned attorney to expedite the prosecution and engage in a joint effort to work out a mutually satisfactory solution.

Except for issue fees payable under 37 C.F.R. § 1.18, the Commissioner is hereby authorized by this paper to charge any additional fees during the entire pendency of this application including fees due under 37 C.F.R. §§ 1.16 and 1.17 which may be required, including any required extension of time fees, or credit any overpayment to Deposit Account No. 19-2380. This paragraph is intended to be a CONSTRUCTIVE PETITION FOR EXTENSION OF TIME in accordance with 37 C.F.R. § 1.136(a)(3).

Respectfully submitted,

Date: May 16, 2007

/Stephen M. Hertzler, Reg. No. 58,247/
Stephen M. Hertzler

NIXON PEABODY LLP
Suite 900, 401 9th Street, N.W.
Washington, D.C. 20004-2128
(202) 585-8000